

NOTES ON SOME BATS FROM THE STATE OF ZACATECAS, MEXICO¹

By JOHN O. MATSON² AND DONALD R. PATTEN²

ABSTRACT: Twenty-three species of bats were known previously to occur in the state of Zacatecas, México. We report upon 29 species, 11 (*Pteronotus parnellii*, *P. davyi*, *Mormoops megalophylla*, *Anoura geofroyi*, *Leptonycteris nivalis*, *Natalus stramineus*, *Myotis planiceps*, *M. auriculus*, *Rhogeessa alleni*, *R. parvula*, and *Eumops perotis*) of which are new records to the state, increasing the total number of species to 34. Five families are currently represented: Mormoopidae (3 species), Phyllostomatidae (12 species), Natalidae (1 species), Vespertilionidae (15 species), and Molossididae (3 species). The third specimen of *Myotis planiceps* and southern range extension of *Eumops perotis* are recorded.

INTRODUCTION

The Mexican state of Zacatecas encompasses approximately 72,800 sq km, most of which lies on the relatively arid, central Mexican Plateau. More importantly, from a zoogeographic viewpoint, the area includes the Sierra Madre Occidental, which comprises much of the western boundary of the state. In the southwestern portion of the state tropical habitats exist in the valley of the Rio Juchipila. Thus, from the varied topography and habitats, one would expect this state to carry a rather diverse fauna.

Literature concerning the chiropteran fauna, indeed the total mammalian fauna, of Zacatecas is scarce. Genoways and Jones (1968) summarized the literature up to that time, as it related to bats. They listed 21 species of bats, seven of which were new state records. Two additional species were recorded by Best, Greer and Elder (1972).

Contained within the collections at the Natural History Museum of Los Angeles County (LACM) are specimens collected in 1970 by Percy L. Clifton. In October 1973, John O. Matson and Robert G. Hannum obtained additional material. Among the specimens thus accumulated, 29 species of bats are represented (five families), 11 of which constitute new records for the state. This brings the total number of bat species known from the state to 34. Our specimens include representatives of two previously unreported families, Mormoopidae (*sensu* Smith 1972) and Natalidae.

All of our Zacatecas specimens are treated in the following accounts. Measurements are in millimeters, catalogue numbers are those of LACM, and all localities are in the state of Zacatecas, Mexico. Abbreviations for standard measurements are as follows: FA, forearm; GLS, greatest length of skull;

¹REVIEW COMMITTEE FOR THIS CONTRIBUTION

Luis de la Torre
Lan A. Lester
James D. Smith

²Section of Mammalogy, Natural History Museum of Los Angeles County, Los Angeles, California 90007

ZB, zygomatic breadth; BB, breadth of braincase; PO, postorbital constriction; and MT, maxillary tooththrow.

Species recorded (see Genoways and Jones 1968 and Best et al 1972) but not represented in our collections include: *Myotis thysanodes*, *M. velifer*, *Lasiurus borealis*, *L. ega*, and *Tadarida aurispinosa*.

Family MORMOOPIDAE

Pteronotus parnellii mexicanus (Miller 1902)

Thirty-five specimens (33948-33956 and 34059-34084) were taken at Monte Escobedo, 2225 m, 11 September 1970, in a pine-oak forest, much of which had been cleared for agriculture. Two specimens (34949 and 34950) were taken 6.4 km S Jalpa, 1311 m, 27 November 1970. Apparently this is the first record of *Pteronotus parnellii* from Zacatecas.

These specimens are referred to the subspecies *mexicanus* (*sensu* Smith 1972) on the basis of small size. Mean forearm lengths, ranges in parentheses, of 20 adult males and 13 adult females from Monte Escobedo are 56.2 (55.1-58.0) and 56.7 (55.5-58.2), respectively. Cranial measurements are similar to those recorded by Smith (1972). No mature females were reproductively active.

This species and the following two represent the first records of occurrence of the family Mormoopidae in the state.

Pteronotus davyi fulvus (Thomas 1892)

Four specimens (34951-34954) were taken 6.4 km S Jalpa, 11-26 November 1970. This area had been extensively cleared for agriculture; however, there were patches of dry, tropical vegetation scattered throughout the region, which consisted of broad-leaved sclerophyllus plants, numerous thorn bushes (*Acacia* sp), and nopal cactus. This locality is in the valley of the Rio Juchipila.

We assign our specimens to the subspecies *fulvus* on the basis of small size (Smith 1972). The forearm lengths of three adult females and one adult male, respectively, are 43.5, 44.5, 45.2, and 44.2. None of the females displayed any signs of reproductive activity.

The variation in color described by Smith (1972) is evident in our four specimens. The male (34953) is a bright, uniform orange, both dorsally and ventrally. One female (34951) is a dull orange-brown dorsally, somewhat lighter below. Another female (34952) is brown above and below, except for a patch of orange on the forehead and chin. The third female (34954) is uniformly brown above and below.

Mormoops megalophylla megalophylla Peters 1864

One specimen (34948) of an adult male was taken on 27 November 1970 from 6.4 km S Jalpa. This specimen has a forearm length of 56.2. Cranial

measurements are within the range given by Smith (1972) for this subspecies. The color of this individual is light pinkish brown dorsally and ventrally.

The above three species occur sympatrically in the area near Jalpa; but, *Pteronotus parnellii* was the only mormoopid taken at Monte Escobedo, a pine-oak forest.

Family PHYLLOSTOMATIDAE

Glossophaga soricina leachii (Gray 1844)

Twenty-two specimens (33957-33971 and 34085-34091) were taken at Santa Rosa, 1219 m, 16-23 June 1970, from mist nets set in a mango orchard near the Rio Juchipila. This was the same locality where Genoways and Jones (1968) first reported the species in Zacatecas. The specimens are easily referred to the species *soricina* based on characters described by Gardner (1962) and Watkins, Jones and Genoways (1972). We assign these individuals to the subspecies *leachii* on the basis of geographic locality.

Anoura geoffroyi lasiopyga (Peters 1868)

Nine specimens (33972-33978, 34092, and 34093) were netted in the same mango orchard at Santa Rosa as the *Glossophaga*. Neither of the two adult females evidenced any signs of reproductive activity; but, two males (in alcohol) had enlarged testes. The species was previously unreported to the fauna of Zacatecas. The mean forearm length of seven adult males, extremes in parentheses, followed by two adult females, respectively, are: 44.1 (42.1-44.8), 43.3, 44.2. Selected cranial measurements for five adult males and two adult females are: GLS, 25.2 (24.4-25.9), 25.0, 24.8; BB, 9.9 (9.8-10.0), 9.5, 9.7; PO, 5.0 (4.9-5.1), 5.0, 5.2; MT, 9.4 (9.3-9.7), 9.5, 9.8.

Choeronycteris mexicana Tschudi 1844

This species was first reported from Zacatecas by Villa-R (1967) on the basis of two specimens from 8 mi (12.9 km) S Moyahua. We have 28 specimens from five localities as follows: Santa Rosa, ten specimens (33982-33991) taken in a nearby cave on 22 June 1970; five (34956-34960) from 6.4 km S Jalpa, 10-23 November 1970; three (33979-33981) from 16.1 km NW Yahaulica (Jalisco), 2164 m, 14 June 1970; seven (33993-33999) from Monte Escobedo, 1-11 September 1970; and three (33992, 34094, and 34095) from 16.1 km SW Concepción del Oro, 2316 m, 31 July 1970. The first two localities above are near the locality reported upon by Villa-R (1967); the remaining localities are considerably more distant and represent a wide variety of habitats, from dry tropical forest to coniferous-oak forests.

Leptonycteris nivalis (Saussure 1860)

On 19 November 1970, eleven males (34961-34970 and 43404) were collected 6.4 km S Jalpa. The habitat is the same as that described for *Pteronotus davyi*. These specimens are referable to the species *nivalis* as defined by Davis and Carter (1962). Other characters which were of use distinguishing

this species from *Leptonycteris sanborni* are given in Phillips (1971), Phillips, Jones and Radovsky (1969), Jones and Genoways (1970), and Watkins et al (1972).

Baker and Cockrum (1966) suggested that this species of long-nosed bat may be restricted to pine-oak forests. The habitat from which our specimens were taken is the upper zone of a dry tropical forest.

Leptonycteris sanborni Hoffmeister 1957

Sanborn's long-nosed bat was first recorded from Zacatecas by Genoways and Jones (1968) from Santa Rosa. We have five adult males (34000-34004) from that same locality taken 17-23 June 1970. One adult female (34955) was taken sympatrically with *Leptonycteris nivalis*. In assigning our specimens to the species *sanborni*, we follow Davis and Carter (1962), not Ramirez-Pulido and Alvarez (1972), (see Watkins et al 1972:16). Selected measurements for both species of *Leptonycteris* are presented in Table 1.

TABLE 1

Selected measurements of two species of *Leptonycteris*. Means followed by extremes in parentheses.

SEX	N	FA	GLS	ZB	BB	PO	MT
<i>Leptonycteris sanborni</i>							
Females	1	52.2	27.0	11.0	9.6	4.5	9.0
Males	5	54.3 (53.5-54.9)	27.1 (27.0-27.2)	10.9 (10.8-11.0)	10.0 (9.6-10.4)	5.1 (4.8-5.4)	9.1 (9.0-9.2)
<i>Leptonycteris nivalis</i>							
Males	7	57.0 (55.7-58.1)	27.9 (27.3-28.4)	11.6 (11.2-12.1)	11.0 (10.8-11.4)	5.4 (5.1-5.7)	9.3 (9.2-9.6)

Sturnira lilium parvidens Goldman 1917

The first record of the yellow-shouldered bat from Zacatecas was a single specimen reported upon by Baker, Webb, and Dalby (1967). Later, Genoways and Jones (1968) reported 21 additional specimens. Both reports were based on approximately the same locality, near Santa Rosa. We have nine specimens of this species (34005-34013), four adult females and five adult males, from that same locality taken 16-23 June 1970. In addition, there are one adult male and one female (34971 and 34972) from 6.4 km S Jalpa, 26-27 November 1970. The four adult females from Santa Rosa had enlarged mammary glands, indicating recent reproductive activity. The single female from near Jalpa did not show any sign of reproductive activity.

Chiroderma salvini scopaeum Handley 1966

Twenty white-lined bats (34014-34033), 11 males and nine females, were netted in a mango orchard at Santa Rosa, 16-18 June 1970. Six of the females were adults with enlarged mammae, the other three were subadult.

Our specimens approximate the measurements of the original description (Handley 1966a).

Artibeus hirsutus Anderson 1906

Genoways and Jones (1968) first recorded the hairy fruit-eating bat from Santa Rosa, Zacatecas. We have 18 (34034-34036, 34096-34109, and 34140) from that same locality taken 16-23 June 1970. Of two adult females, one had enlarged mammae. Two additional localities are as follows: two specimens (34037-34038) from Monte Escobedo, 1 September 1970; and 18 specimens (34973-34988, 43405, and 43406) from 16.1 km W Jalpa, 3-4 December 1970. Three of the 18 from near Jalpa were adult females displaying no sign of reproductive activity.

Artibeus jamaicensis triomylus Handley 1966

Forty-two Jamaican fruit-eating bats (34041-34058 and 34110-34133) were netted in a mango and banana orchard near Santa Rosa, 1219 m, 16-23 June 1970. Of 15 adult females, 12 had enlarged mammae. This subspecies is characterized by the presence of the third upper molar in over 95% of the specimens (Handley 1966a). The M^3 was present in 18 of our specimens prepared as study skins and skulls. In addition, our measurements do not differ considerably from those given by Handley (1966a).

Artibeus lituratus palmarum J. A. Allen and Chapman 1897

Two adult males (34039 and 34040) of this large fruit-eating bat were netted in the same orchard at Santa Rosa as *Artibeus jamaicensis* on 16 and 17 June 1970. Forearm lengths of these two individuals are 63.8 and 64.2.

Artibeus toltecus hesperus Davis 1969

Twenty-four specimens (34134-34139, 34141-34143, and 34251-34264) of this species were netted under the same conditions at Santa Rosa as was *Artibeus jamaicensis*, on 16-23 June 1970. This species was previously recorded from Santa Rosa by Genoways and Jones (1968) without subspecific designation. The Pacific Coast populations are now considered a distinct subspecies, *hesperus*, by Davis (1969), based upon smaller size than the nominate subspecies *toltecus*. Our specimens agree in size with the measurements given by Davis (1969). Five of nine adult females had enlarged mammae.

Desmodus rotundus murinus Wagner 1840

The vampire bat was first recorded from Zacatecas by Cockrum (1956), who considered reproductive aspects only. Genoways and Jones (1968) reported the same specimen, which was one of a series of 31 from near Jalpa, as well as other specimens from Santa Rosa. We have specimens from the following localities: Santa Rosa, 30 specimens (34144-34157 and 34265-34280) taken 17-21 June 1970; 6.4 km S Jalpa, 55 specimens (34990-35008

and 43407-43442) taken 9-15 November 1970; 16.1 km W Jalpa, 8 specimens (35009-35011 and 43443-43447) taken on 3 December 1970; 12.9 km NW Nochistlán, one specimen (34989) on 9 November 1970; and Monte Escobedo, 22 specimens (34158-34174 and 34281-34285) taken 1-9 September 1970. These last two localities are interesting because of their elevation, 2012 m and 2225 m, respectively. The habitat at Monte Escobedo is a pine-oak forest.

Family NATALIDAE

Natalus stramineus mexicanus Miller 1902

An adult female (34286) of the funnel-eared bat was captured in a cave near Santa Rosa, on the Rio Juchipila, 22 June 1970. Only one other species of bat (*Choeronycteris mexicana*) was taken in this cave. This represents the first record of the family Natalidae to the fauna of Zacatecas. Selected measurements of our specimen are as follows: FA, 37.8; GLS, 15.2; ZB, 7.9; BB, 7.5; PO, 3.0; MT, 6.4.

We follow Handley (1966b) and Linares (1971) in referring our specimen to the subspecies *mexicanus*. Goodwin retained the name *saturatus* for populations south of Sinaloa; but, stated "There do not appear to be any actual characters separating *saturatus* from *mexicanus*. . ." (Goodwin 1959:7). In the original description of *saturatus*, major emphasis was placed on its dark color (Dalquest and Hall 1949). In our collections we have specimens from Sonora, Sinaloa, and Nayarit and find color to be a highly variable character. Measurements of our specimen agree with those given by Linares (1971).

Family VESPERTILIONIDAE

Myotis planiceps Baker 1955

One subadult female (34315) flat-headed bat was captured 16 km SW Concepción del Oro, 2316 m, 31 July 1970. The specimen was taken in a pine forest from a net set across a dry arroyo, under overhanging pine trees (Clifton, personal communication). Insofar as we can determine, this is the third specimen of *Myotis planiceps* on record; the first was described by Baker (1955) from Bella Unión, Coahuila. A second specimen was recorded from Cerro Potosí, Nuevo León (Jimenez 1968).

We assign our specimen to this species on the basis of its greatly flattened head, relatively small teeth, and short forearm (26.9). Selected cranial measurements are: GLS, 13.6; ZB, 7.9; PO, 3.4; palatal length, 6.3; MT, 4.7.

The flattened skull of this species suggests an adaptation for living in crevices, as appears to be the case in some African and South American flat-headed bats (Meester 1971, Davis 1970). The specimen reported upon by Jimenez (1968) was taken from beneath the bark of a Douglas fir.

Myotis auriculus apache Hoffmeister and Krutzsch 1955

An adult male (34323) of the big-eared *Myotis* was netted in the morning at the entrance of a cave, 16 km NW Yahualica (Jalisco), 2164 m, 14 June

1970. The habitat was a pine-oak forest, the cave being in a deep canyon just south of the above locality. To our knowledge, this is the first record of *Myotis auriculus* from Zacatecas. The nearest localities from which this species was previously recorded are in the state of Jalisco (Findley 1960, Genoways and Jones 1969, Watkins et al 1972).

Selected measurements of our specimen are: FA, 38.7; GLS, 16.7; ZB, 10.3; BB, 8.1; PO, 4.0; MT, 6.7. It is assigned to the subspecies *apache* on the basis of its light color. The distal portion of the right wing, between the third and fourth digits, is white.

Myotis leibii melanorhinus (Merriam 1890)

One adult male (35047) of *Myotis leibii* was taken 29 September 1970 from 4.9 km N Ciudad Cuauhtémoc, 2012 m. Generally, the area is characterized by the presence of mesquite, nopal cactus, and grasses. There are a few small junipers scattered about, indicating the lower level of the transition zone. The species was first recorded from Zacatecas, 9.7 mi (15.6 km) NW Cuauhtémoc by Best et al (1972).

This species is often difficult to separate from *M. californicus* (Anderson 1972). It differs from *M. californicus* in having a more flattened cranium, a larger thumb, and longer, more glossy pelage. Recently, Bogan (1974) has demonstrated characters which are very useful in separating the two species. Selected measurements of our specimen are: FA, 32.4; GLS, 13.7; BB, 6.5; PO, 3.2; MT, 5.2.

Another specimen (34320), a subadult male, cannot be definitely identified to this species or to *M. californicus*, as the skull is missing. The external characters seem to be closest to *M. leibii*. It is from 16 km NW Yahualica (Jalisco), 2164 m, 14 June 1970.

Myotis californicus californicus (Audubon and Bachman 1842)

Two specimens (34318 and 34319), both adult females, were taken from an Indian house 21 km SW Camacho, 1768 m, on 12 August 1970. Neither specimen exhibited any sign of reproductive activity. This locality is in the arid northeast corner of the state. Characteristic plants include nopal cactus, mesquite, and a few Joshua trees, with very little ground cover. These individuals are assigned to the subspecies *californicus* on the basis of their pale coloration.

Myotis californicus mexicanus (Saussure 1860)

Four specimens were taken as follows: one adult female (34316) from 16 km NW Yahualica (Jalisco), 14 June 1970; one adult female (34321) from 9.6 km SW Jalpa, 26 June 1970; one adult male (34317) from Santa Rosa, 16 June 1970; and one adult male (35048) from 12.9 km NW Nochistlán, 27 October 1970. These localities are all somewhat more mesic than the locality from which the preceding subspecies was taken. Our specimens are

dark in color. On this basis we assign them to the subspecies *mexicanus*, following Genoways and Jones (1968).

Myotis yumanensis lutosus Miller and G. M. Allen 1928

An adult male (34322) of this species was captured in a net set across a creek near Santa Rosa, 21 June 1970. Another adult male (35049) was taken 6.4 km S Jalpa, 11 November 1970.

Pipistrellus hesperus hesperus (H. Allen 1864)

Seven western pipistrells (34175, 34176, and 34308-34312), six adult and one subadult females, were netted in the same orchard at Santa Rosa as was *Artibeus jamaicensis*. Two adult females (35050 and 35051) were taken 6.4 km S Jalpa, 11 and 27 November 1970. Baker et al (1967) first reported on a Zacatecan specimen from the same general area, assigning it to the subspecies *australis*. Recently, Findley and Traut (1970) revised this species and recognized only two subspecies: a large-sized eastern population, *maximus*; and a small-sized western population, *hesperus*. Our specimens are referable to the smaller sized populations in regard to cranial measurements. The mean forearm length of six adult females from Santa Rosa is 29.0 (27.9-29.8), which is somewhat smaller than that given by Findley and Traut (1970). Forearm measurements for the two females from near Jalpa are also small, 27.9 and 28.7.

Eptesicus fuscus miradorensis (H. Allen 1866)

One specimen, an adult male (34324), of the big brown bat was taken 16 km NW Yahualica (Jalisco) under the same conditions as stated for *Myotis auriculus*. We follow Baker and Greer (1962) and Genoways and Jones (1968) in assigning our dark colored specimen to the subspecies *miradorensis*.

Rhogeessa alleni Thomas 1892

In the recent revision of the genus *Rhogeessa*, there were no specimens available from Zacatecas (La Val 1973). We now have five specimens from Zacatecas, as follows: two adult males (35042 and 35043) and two adult females (35044 and 35046) from 6.4 km S Jalpa; and one adult male (35045) from 16 km W Jalpa. The habitat at 6.4 km S Jalpa is as described in the account of *Pteronotus davyi*. Selected measurements of the two males and two females, respectively, from south of Jalpa are: FA, 32.4, 33.1, 33.9, 34.2; GLS, 14.9, 14.8, 15.3, 15.4; ZB, 9.0, 9.2, 9.0, 9.6; BB, 6.4, 6.5, 6.7, 6.7; PO, 3.3, 3.3, 3.3, 3.3; MT, 5.2, 5.1, 5.3, 5.4. The same measurements, in order, for one male from west of Jalpa are 33.0, 14.8, 9.3, 6.7, 3.4, 5.2. Previously, the known northernmost record of occurrence for this species was in central Jalisco (Watkins et al 1972, La Val 1973).

Rhogeessa parvula H. Allen 1866

A subadult female (34313) and an adult female (34314) were netted in a mango orchard at Santa Rosa, 23 June 1970. Previously, the closest locality

to Zacatecas from which specimens were recorded was near Guadalajara, Jalisco (Watkins et al 1972). The species is considered to be monotypic by La Val (1973). We follow La Val's (1973) classification, not Goodwin (1958). Selected measurements of the adult followed by the subadult are: FA, 28.9, 26.2; GLS, 12.5, 12.0; ZB, 7.6, 7.0; BB, 5.6, 5.5; PO, 2.9, 2.9; MT, 4.4, 4.2.

Plecotus mexicanus G. M. Allen 1916

One specimen of this species was previously reported from Sierra de Valparaíso, 8200 ft (2499 m) (Handley 1959). We have six specimens as follows: one adult male (34287) netted at the entrance of a cave, 16 km NW Yahualica (Jalisco); one adult male (35022), two adult females (35021 and 35033), and one subadult female (35034) from 4.9 km N Ciudad Cuauhtémoc; and one adult male (35041) from 12.9 km NW Nochistlán. These were all taken below the pine-oak forests which Handley (1959) believed to be their preferred habitat. These areas do support a few scattered junipers, indicative of the transition zone. None of the females exhibited any external sign of reproductive activity. Measurements do not differ greatly from those given by Handley (1959).

Plecotus townsendii australis Handley 1955

Ninety-four specimens of the western big-eared bat (34177-34250 and 34288-34307) were taken from an abandoned mine tunnel near La Laja, 16 km SW Concepción del Oro, 2316 m, 2 August 1970. This area is at the lower level of the pine-oak-juniper forest. Other mines in the area contained no bats and this one had only *Plecotus townsendii* (Clifton, personal communication). Apparently, this was a maternity colony, as 62 adult females had enlarged mammae. Only 12 specimens were male. Of eight fluid preserved males, three had enlarged testes.

Twenty-four specimens (35012-35020, 35023-35032, and 35035-35039) were taken 4.9 km N Ciudad Cuauhtémoc, 20-25 September 1970 and 6-14 October 1970. Again, there was a predominance of females, 18 to 6. None of the 12 adult females displayed any sign of reproductive activity. One female adult (35040) was taken 12.9 km NW Nochistlán. It did not evidence any sign of reproductive activity. *Plecotus mexicanus* was taken sympatrically at these last two localities.

Specimens from Cuauhtémoc and Nochistlán are considerably darker than those from Concepción del Oro and are easily referable to *P. t. australis*. Those from Concepción del Oro approach *P. t. pallescens* in color. Handley (1959) restricted the area of color intergradation between these two subspecies to northern Coahuila and southern Texas. Our data indicate that the color intergradation may be even greater. Selected measurements of *P. townsendii* from Concepción del Oro and Cuauhtémoc are given in Table 2.

TABLE 2

Selected measurements of *Plecotus townsendii* from two localities in Zacatecas. Means followed by extremes in parentheses. Superscript indicates differences in N.

SEX	N	FA	GLS	ZB	BB	PO	MT
Concepción del Oro							
Females	74	44.7 (43.1-46.4)	16.4 ¹⁶ (16.1-16.7)	8.8 ¹³ (8.5-9.1)	7.8 ¹⁶ (7.7-8.0)	3.6 ¹⁶ (3.4-3.7)	5.2 ¹⁶ (5.1-5.3)
Males	10	44.0 (43.5-45.0)	16.2 ¹	8.8 ¹	7.9 ¹	3.6 ¹	5.2 ¹
Cuauhtémoc							
Females	13	43.8 (42.8-45.1)	16.1 ¹² (15.8-16.5)	8.7 ¹⁰ (8.3-8.9)	7.8 ¹² (7.6-8.1)	3.6 ¹² (3.4-3.8)	5.2 ¹² (5.0-5.3)
Males	5	43.0 (42.2-43.6)	16.2 (15.7-16.5)	8.7 ¹	7.9 ⁴ (7.8-8.0)	3.6 (3.5-3.7)	5.2 (5.1-5.3)

Family MOLOSSIDAE

Tadarida brasiliensis mexicana (Saussure 1860)

On the evening of 16 June 1970, Percy Clifton set a net partially across the Rio Juchipila at Santa Rosa and obtained three Mexican free-tailed bats, two adult females (34325 and 34327) and one adult male (34326). Another adult male (35052) was captured 12.9 km NW Nochistlán, 30 October 1970. This species was previously reported from Zacatecas by Villa-R (1967) and Genoways and Jones (1968).

Eumops perotis (Schinz 1821)

The presence of an adult male (34328) of *Eumops perotis* in Zacatecas was unexpected. Based on geographic records (Hall and Kelson 1959, Watkins et al 1972) we expected to find *E. underwoodi*. Although Anderson (1972) did not have any specimens of *E. perotis* from Chihuahua, he expected them to occur in the more arid parts of the state. Our specimen was captured in a net at Santa Rosa under the same conditions as stated for *Tadarida brasiliensis*, a tropical habitat. Our specific determination is based upon its elongated rostrum and long forearm (77.4). Selected cranial measurements of our specimen are: GLS, 31.1; ZB, 18.7; PO, 5.1; MT, 12.6; rostral breadth, 9.8. This is the southernmost locality record for the species in continental North America.

ZOOGEOGRAPHICAL COMMENTS

Though the following comments are tentative, we believe that general zoogeographic trends are apparent. Currently, 34 species of bats belonging to five families are represented in the state of Zacatecas. These include three mormoopids, 12 phyllostomatids, one natalid, 15 vespertilionids, and three molossids. The majority of bat species (20) are primarily neotropical in their affinities. Eleven species are of the temperate zone and three are widespread.

Tropical species include the mormoopids, all of the phyllostomatids, the single natalid, three vespertilionids (*Lasiurus ega*, *Rhogeessa alleni*, and *R.*

parvula), and one molossid (*Tadarida aurispinosa*). The temperate zone species include ten vespertilionids (*Myotis planiceps*, *M. yumanensis*, *M. velifer*, *M. auriculus*, *M. thysanodes*, *M. californicus*, *M. leibii*, *Pipistrellus hesperus*, *Plecotus townsendii*, and *P. mexicanus*) and one molossid (*Eumops perotis*). The three species having widespread distribution in both temperate and tropical areas are *Lasiurus borealis*, *Eptesicus fuscus*, and *Tadarida brasiliensis*.

ACKNOWLEDGMENTS

We thank Andrew Starrett, Luis de la Torre, James D. Smith, and Lan A. Lester for their reviews and helpful suggestions. We gratefully acknowledge the financial support of the Natural History Museum Foundation which supported the field work in October 1973. We thank Douglas B. Williams for assistance in preparing the Spanish summary. We kindly thank Betty Birdsall and Margaret Taylor for typing the manuscript.

RESUMEN

Previamente se conocía la ocurrencia de solamente 23 especies de murciélagos en el estado de Zacatecas, México. Aquí se informan acerca de 29 especies, 11 (*Pteronotus parnellii*, *P. davyi*, *Mormoops megalophylla*, *Anoura geoffroyi*, *Leptoncycteris nivalis*, *Natalus stramineus*, *Myotis planiceps*, *M. auriculus*, *Rhogeessa alleni*, *R. parvula*, y *Eumops perotis*) de las cuales son nuevas adiciones a la fauna, aumentando el número total de especies conocidas a 34. Se representan actualmente cinco familias: Mormoopidae (3 especies), Phyllostomatidae (12 especies), Natalidae (1 especie), Vespertilionidae (15 especies), y Molossidae (3 especies). Mereciendo especial atención son el tercero ejemplar registrado de *Myotis planiceps* y la extensión sureña del distribución de *Eumops perotis*.

LITERATURE CITED

- ANDERSON, S. 1972. Mammals of Chihuahua, taxonomy and distribution. Amer. Mus. Nat. Hist., Bull. 148: 149-410.
- BAKER, R. H. 1955. A new species of bat (genus *Myotis*) from Coahuila, México. Proc. Biol. Soc. Washington 68: 165-166.
- BAKER, R. H. AND J. K. GREER. 1962. Mammals of the Mexican state of Durango. Michigan St. Univ., Biol. Ser. 2: 25-154.
- BAKER, R. H., R. G. WEBB, AND P. DALBY. 1967. Notes on reptiles and mammals from southern Zacatecas. Amer. Midland Nat. 77: 223-226.
- BAKER, R. J. AND E. L. COCKRUM. 1966. Geographic and ecological range of the long-nosed bats, *Leptoncycteris*. J. Mamm. 47: 329-331.
- BEST, T. L., J. K. GREER, AND F. F. B. ELDER. 1972. Two bat records from Zacatecas, México. Southwestern Nat. 17: 97-98.
- BOGAN, M. A. 1974. Identification of *Myotis californicus* and *M. leibii* in southwestern North America. Proc. Biol. Soc. Washington 87: 49-56.
- COCKRUM, E. L. 1956. Reproduction in North American bats. Trans. Kansas Acad. Sci. 58: 487-511.
- DALQUEST, W. W. AND E. R. HALL. 1949. A new subspecies of the funnel-eared bat (*Natalus mexicanus*) from eastern México. Proc. Biol. Soc. Washington 62: 153-154.

- DAVIS, W. B. 1969. A review of the small fruit bats (genus *Artibeus*) of Middle America. *Southwestern Nat.* 14: 15-29.
- . 1970. *Tomopeas ravus* Miller (Chiroptera). *J. Mamm.* 51: 244-247.
- DAVIS, W. B. AND D. C. CARTER. 1962. Review of the genus *Leptonycteris* (Mammalia: Chiroptera). *Proc. Biol. Soc. Washington* 75: 193-198.
- FINDLEY, J. S. 1960. Identity of the long-eared *Myotis* of the Southwest and México. *J. Mamm.* 41: 16-20.
- FINDLEY, J. S. AND G. L. TRAUT. 1970. Geographic variation in *Pipistrellus hesperus*. *J. Mamm.* 51: 741-765.
- GARDNER, A. L. 1962. A new bat of the genus *Glossophaga* from México. *Los Angeles Co. Mus., Contrib. Sci.* 54: 1-7.
- GENOWAYS, H. H. AND J. K. JONES, JR. 1968. Notes on bats from the Mexican state of Zacatecas. *J. Mamm.* 49: 743-745.
- . 1969. Taxonomic status of certain long-eared bats (genus *Myotis*) from the southwestern United States and México. *Southwestern Nat.* 14: 1-13.
- GOODWIN, G. G. 1958. Bats of the genus *Rhogeessa*. *Amer. Mus. Novit.* 1923: 1-17.
- . 1959. Bats of the subgenus *Natalus*. *Amer. Mus. Novit.* 1977: 1-22.
- HALL, E. R. AND K. R. KELSON. 1959. The mammals of North America. New York, The Ronald Press Co., Vol. 1, 546 pp.
- HANDLEY, C. O., JR. 1959. A revision of American bats of the genera *Enderma* and *Plecotus*. *U. S. Nat. Mus., Proc.* 110: 95-246.
- . 1966a. Descriptions of new bats (*Chiroderma* and *Artibeus*) from México. *An. Inst. Biol. (Mexico)* 36: 297-301.
- . 1966b. Checklist of mammals of Panama. In: *Ectoparasites of Panama* (R. L. Wenzel and V. J. Tipton, eds.). *Field Mus. Nat. Hist., Chicago*, 861 pp.
- JIMENEZ, A. G. 1968. Nuevos registros de murciélagos para Nuevo León, México. *An. Inst. Biol. Univ. Nac. Auto. Mexico, Ser. Zool.* 39: 133-144.
- JONES, J. K., JR. AND H. H. GENOWAYS. 1970. Chiropteran systematics. In: *About Bats* (B. H. Slaughter and D. W. Walton, eds.). *Southern Methodist Univ. Press, Dallas*, 339 pp.
- LA VAL, R. K. 1973. Systematics of the genus *Rhogeessa* (Chiroptera: Vespertilionidae). *Mus. Nat. Hist., Univ. Kansas, Occas. Papers* 19: 1-47.
- LINARES, O. J. 1971. A new subspecies of funnel-eared bat (*Natalus stramineus*) from western Venezuela. *So. California Acad. Sci., Bull.* 70: 81-84.
- MEESTER, J. 1971. Order Chiroptera, part 2. In: *The mammals of Africa, an identification manual* (J. Meester and H. W. Setzer, eds.). *Smithsonian Inst. Press, Washington*.
- PHILLIPS, C. J. 1971. The dentition of glossophagine bats: development, morphological characteristics, variation, pathology, and evolution. *Mus. Nat. Hist., Univ. Kansas, Misc. Publ.* 54: 1-132.
- PHILLIPS, C. J., J. K. JONES, JR., AND F. J. RADOVSKY. 1969. Macronyssid mites in the oral mucosa of long-nosed bats: occurrence and associated pathology. *Science* 165: 1368-1369.
- RAMIREZ-PULIDO, J. AND T. ALVAREZ. 1972. Notas sobre los murciélagos del género *Leptonycteris* en México, con la designación del lectotipo de *L. yerbabuena* Martínez y Villa, 1940. *Southwestern Nat.*, 16: 249-259.
- SMITH, J. D. 1972. Systematics of the chiropteran family Mormoopidae. *Misc. Publ. Mus. Nat. Hist. Univ. Kansas*, 56: 1-132.
- VILLA-R, B. 1967. Los murciélagos de México. *Univ. Nac. Auto. Mexico*, xvi + 491 pp.
- WATKINS, L. C., J. K. JONES, JR., AND H. H. GENOWAYS. 1972. Bats of Jalisco, México. *Special Publ. Mus. Texas Tech Univ.*, 1: 1-44.

Accepted for publication October 3, 1974